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Zdepski

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(54) **SYSTEMS AND METHODS TO POSITION AND PLAY CONTENT**

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H04N 21/44	(2011.01)
H04N 21/472	(2011.01)
H04N 21/488	(2011.01)

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CPC ***H04N 5/783*** (2013.01); ***H04N 9/87*** (2013.01); ***H04N 21/44016*** (2013.01); ***H04N 21/47217*** (2013.01); ***H04N 21/4882*** (2013.01); ***H04N 21/812*** (2013.01); ***H04N 21/8455*** (2013.01); ***H04N 21/8456*** (2013.01)

(58) **Field of Classification Search**

USPC 386/205, 206, 221, 222, 228, 343, 345, 386/346, 347, 348, 349

See application file for complete search history.

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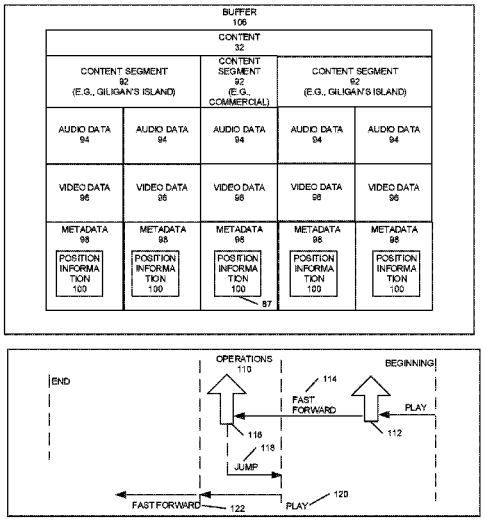
(57) **ABSTRACT**

Systems and methods to position and play content. The system renders a first content segment to an output device at an accelerated speed for the first content segment. Next, the system receives a request to play the first content segment from the beginning of the first content segment at a normal speed for the first content segment. Next, the system automatically positions to the beginning of the first content segment based on position information that is associated with the first content segment. Finally, the system renders the first content segment to the output device from the beginning of the first content segment at a normal speed for the first content segment.

20 Claims, 9 Drawing Sheets



Related U.S. Application Data

continuation of application No. 11/680,360, filed on Feb. 28, 2007, now Pat. No. 8,331,772.

(60) Provisional application No. 60/824,797, filed on Sep. 7, 2006.

(51) **Int. Cl.**
H04N 21/81 (2011.01)
H04N 21/845 (2011.01)

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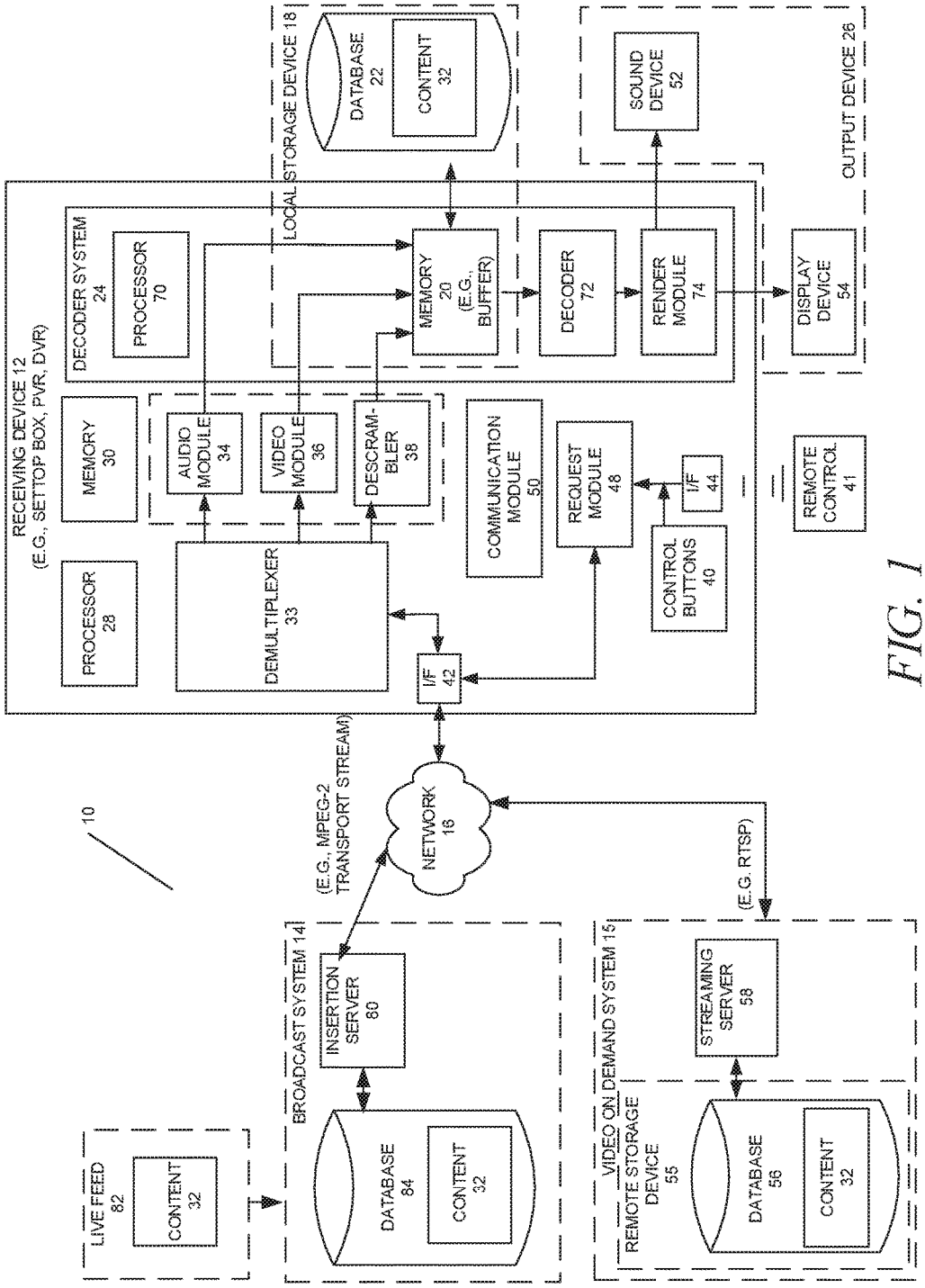
10
RECEIVING DEVICE 12
(E.G., SETTOP BOX, PVR, DVR)
PROCESSOR 28
MEMORY 30
DECODER SYSTEM 24
PROCESSOR 70
LOCAL STORAGE DEVICE 18
DATABASE 22
CONTENT 32
MEMORY 20 (E.G., BUFFER)
DECODER 72
RENDER MODULE 74
DISPLAY DEVICE 54
OUTPUT DEVICE 26
SOUND DEVICE 52
AUDIO MODULE 34
VIDEO MODULE 36
DESCRAM-BLER 38
DEMULTIPLEXER 33
COMMUNICATION MODULE 50
REQUEST MODULE 48
I/F 42
I/F 44
CONTROL BUTTONS 40
REMOTE CONTROL 41
NETWORK 16
(E.G., MPEG-2 TRANSPORT STREAM)
(E.G. RTSP)
LIVE FEED 82
CONTENT 32
BROADCAST SYSTEM 14
INSERTION SERVER 60
DATABASE 84
CONTENT 32
VIDEO ON DEMAND SYSTEM 15
REMOTE STORAGE DEVICE 55
STREAMING SERVER 58
DATABASE 56
CONTENT 32

FIG. 1

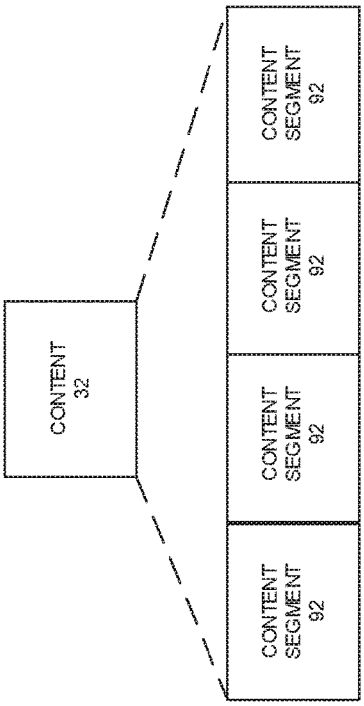
CONTENT
32
CONTENT SEGMENT
92
CONTENT SEGMENT
92
CONTENT SEGMENT
92
CONTENT SEGMENT
92

FIG. 2

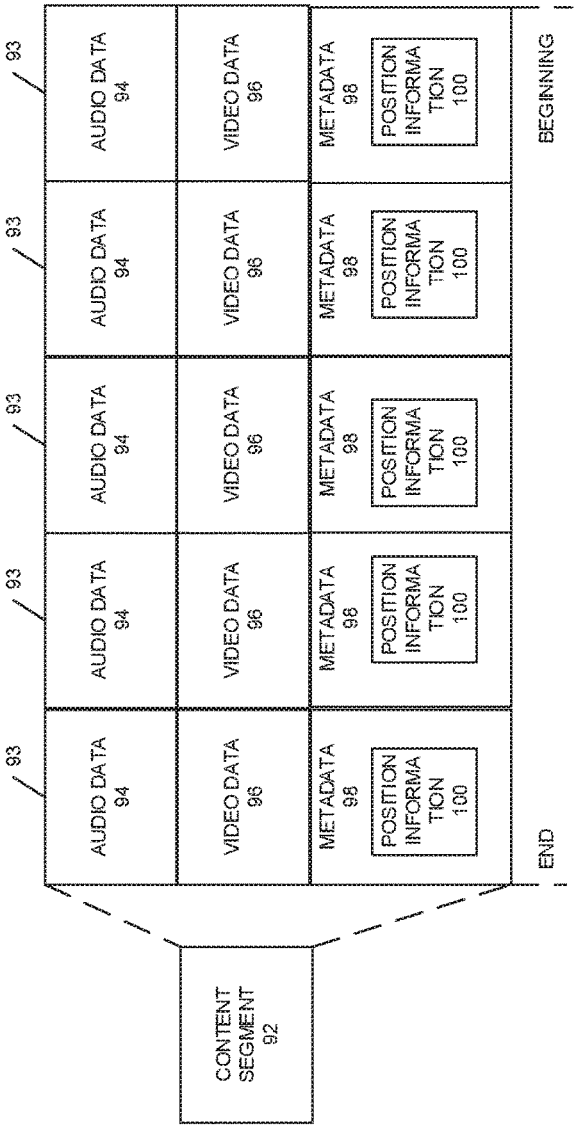
93
AUDIO DATA
94
VIDEO DATA
96
METADATA
98
POSITION INFORMATION
100
CONTENT SEGMENT
92
BEGINNING
END

FIG. 3

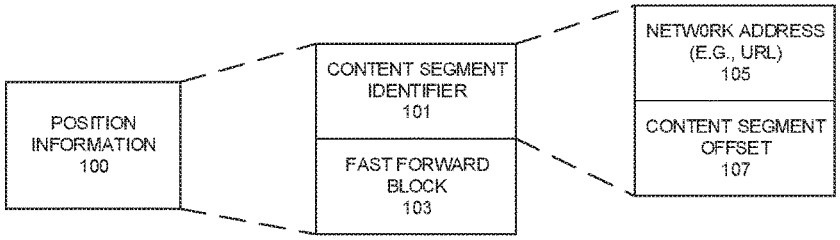
POSITION INFORMATION 100
CONTENT SEGMENT IDENTIFIER 101
FAST FORWARD BLOCK 103
NETWORK ADDRESS (E.G., URL) 105
CONTENT SEGMENT OFFSET 107

FIG. 3A

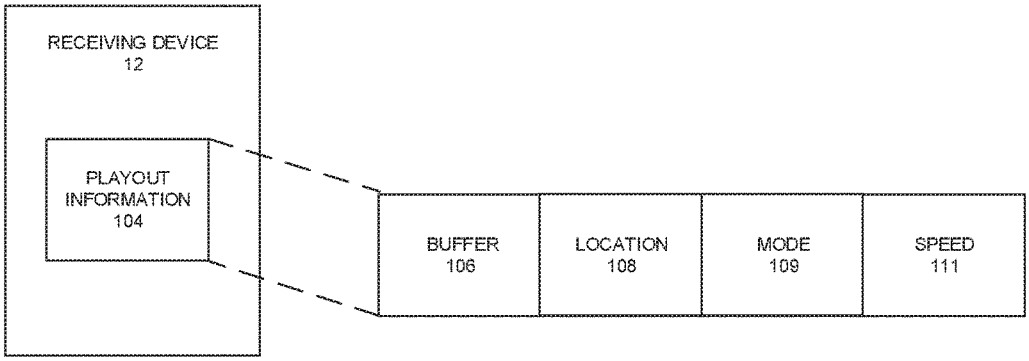
RECEIVING DEVICE 12
PLAYOUT INFORMATION 104
BUFFER 106
LOCATION 108
MODE 109
SPEED 111

FIG. 4

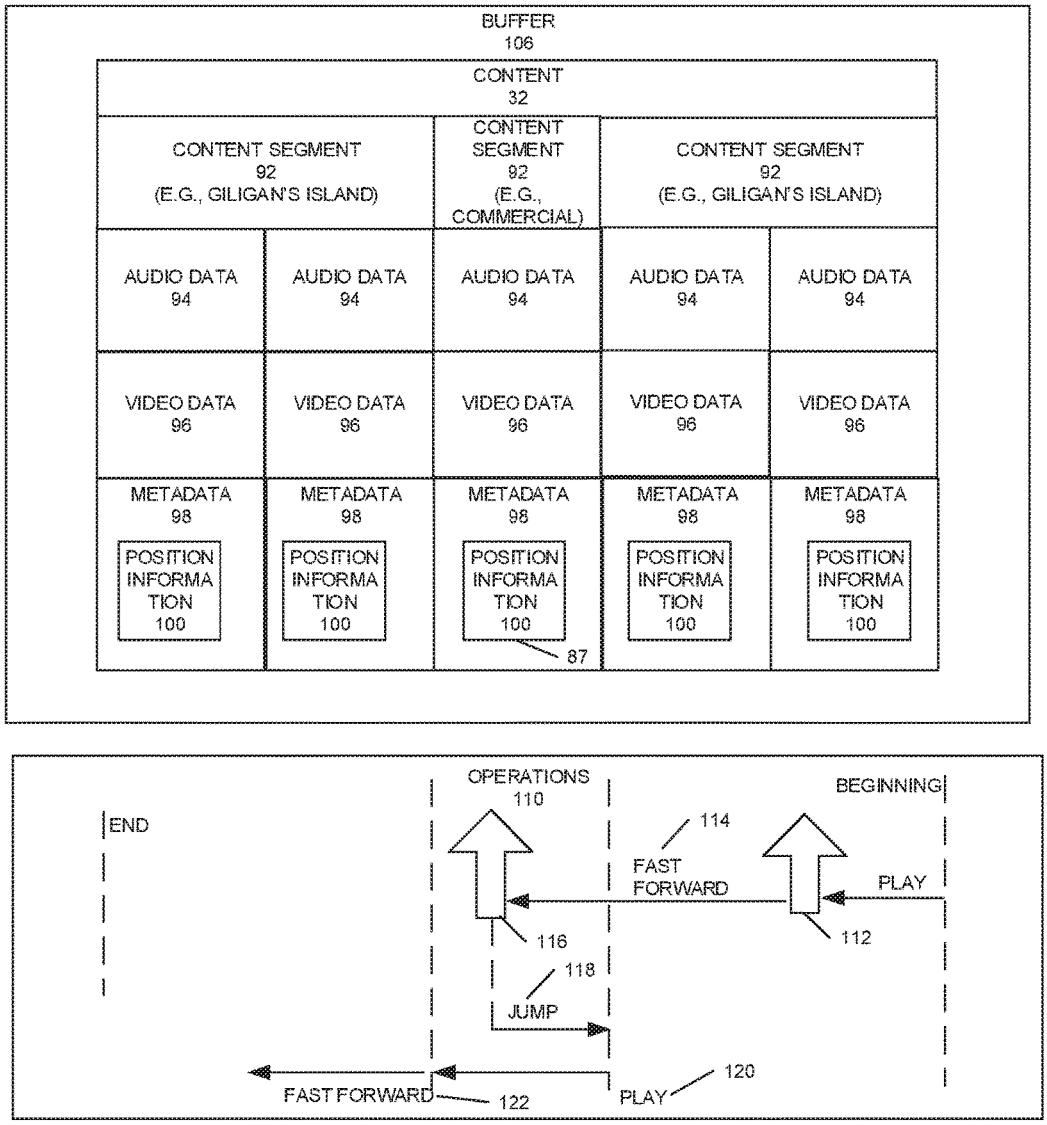
BUFFER
106
CONTENT
32
CONTENT SEGMENT
92
(E.G., GILIGAN'S ISLAND)
CONTENT
SEGMENT
92
(E.G.,
COMMERCIAL)
CONTENT SEGMENT
92
(E.G., GILIGAN'S ISLAND)
AUDIO DATA
94
VIDEO DATA
96
METADATA
98
POSITION
INFORMA
TION
100
87
END
OPERATIONS
110
BEGINNING
114
FAST
FORWARD
PLAY
116
112
118
JUMP
120
FAST FORWARD
122
PLAY

FIG. 5

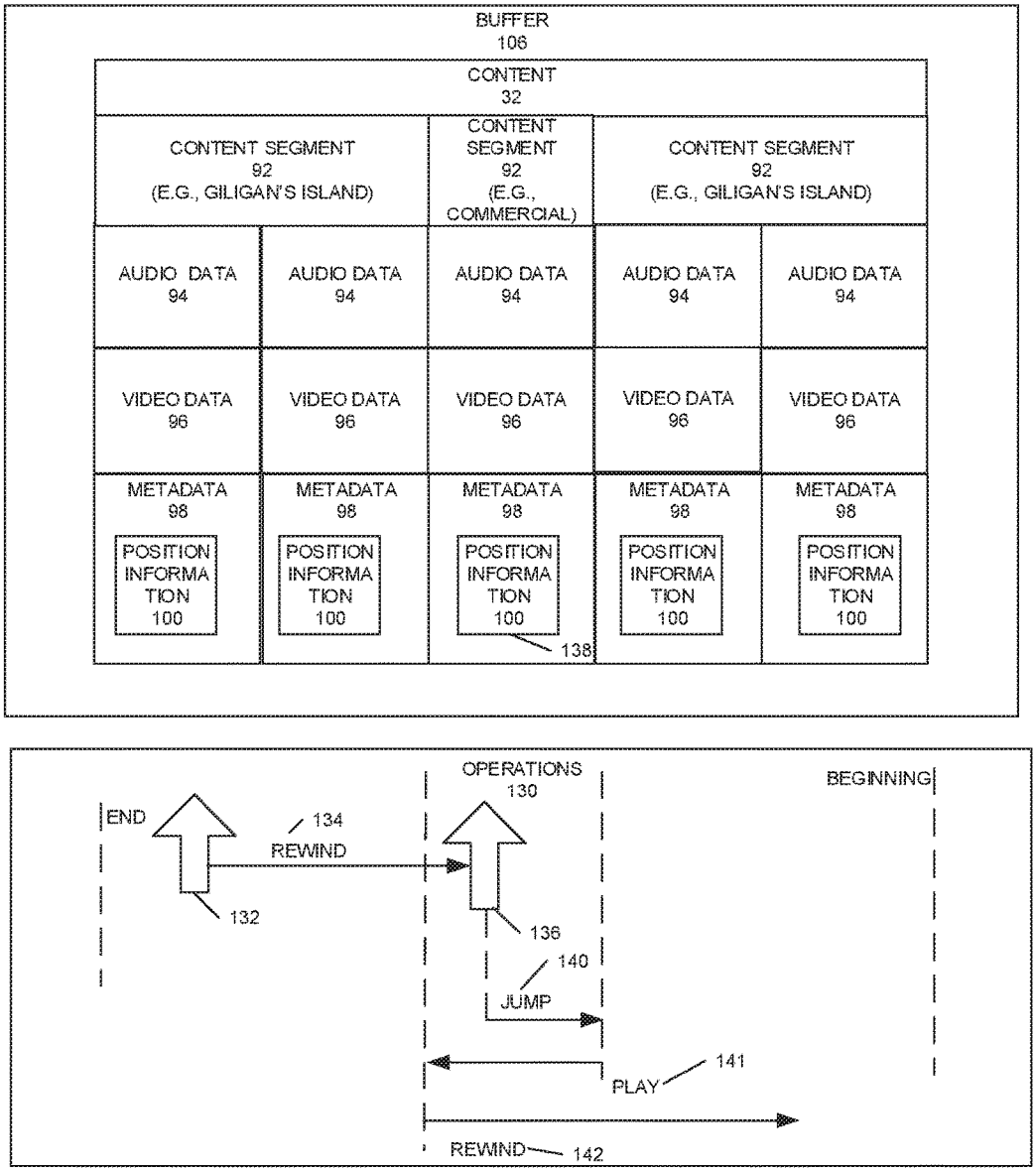
BUFFER
106
CONTENT
32
CONTENT SEGMENT
92
(E.G., GILIGAN'S ISLAND)
CONTENT
SEGMENT
92
(E.G.,
COMMERCIAL)
CONTENT SEGMENT
92
(E.G., GILIGAN'S ISLAND)
AUDIO DATA
94
VIDEO DATA
96
METADATA
98
POSITION
INFORMA
TION
100
138
OPERATIONS
130
BEGINNING
END
134
REWIND
132
136
140
JUMP
141
PLAY
REWIND
142

FIG. 6

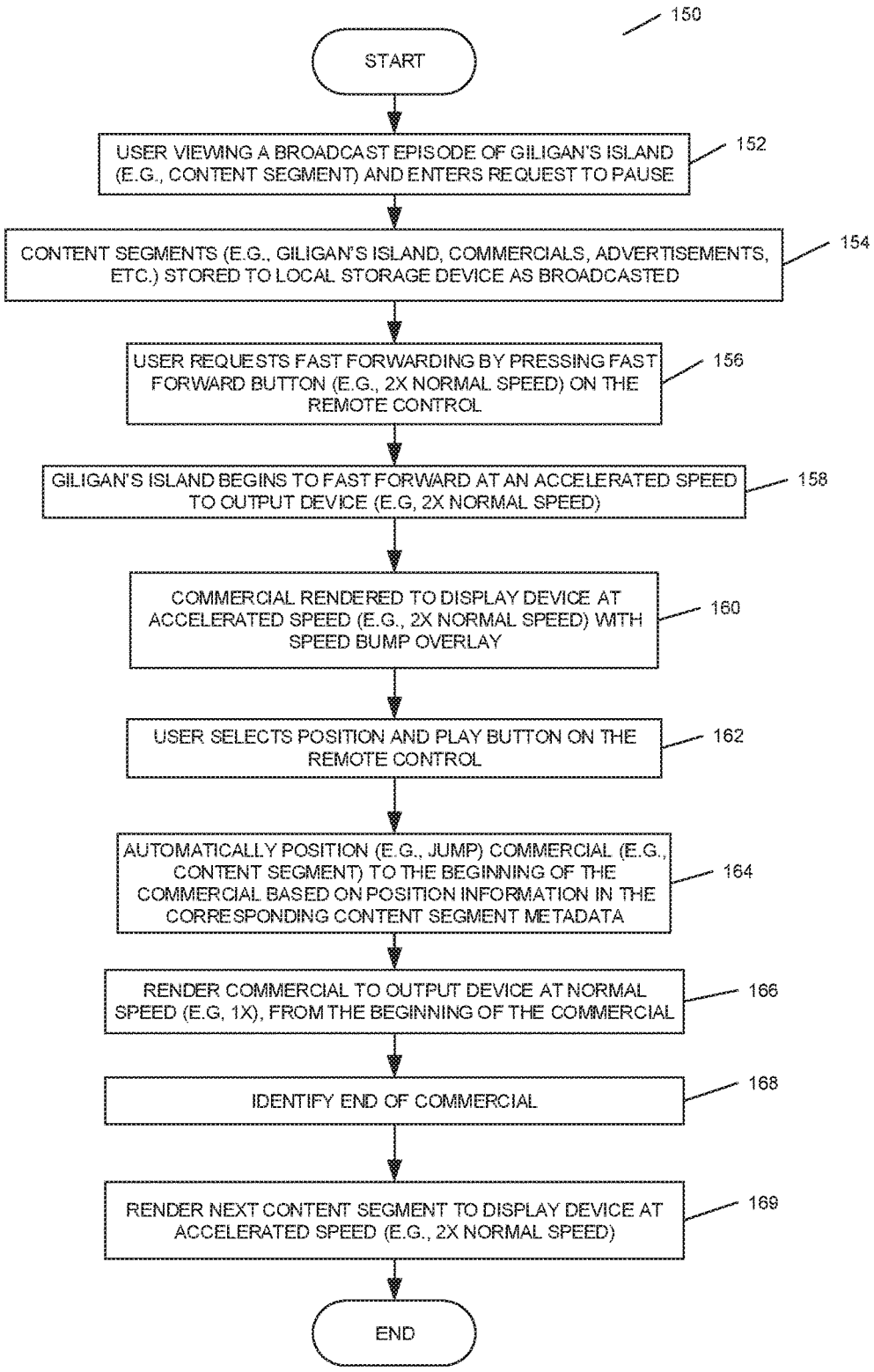
150
START
USER VIEWING A BROADCAST EPISODE OF GILIGAN'S ISLAND (E.G., CONTENT SEGMENT) AND ENTERS REQUEST TO PAUSE
152
CONTENT SEGMENTS (E.G., GILIGAN'S ISLAND, COMMERCIALS, ADVERTISEMENTS, ETC.) STORED TO LOCAL STORAGE DEVICE AS BROADCASTED
154
USER REQUESTS FAST FORWARDING BY PRESSING FAST FORWARD BUTTON (E.G., 2X NORMAL SPEED) ON THE REMOTE CONTROL
156
GILIGAN'S ISLAND BEGINS TO FAST FORWARD AT AN ACCELERATED SPEED TO OUTPUT DEVICE (E.G, 2X NORMAL SPEED)
158
COMMERCIAL RENDERED TO DISPLAY DEVICE AT ACCELERATED SPEED (E.G., 2X NORMAL SPEED) WITH SPEED BUMP OVERLAY
160
USER SELECTS POSITION AND PLAY BUTTON ON THE REMOTE CONTROL
162
AUTOMATICALLY POSITION (E.G., JUMP) COMMERCIAL (E.G., CONTENT SEGMENT) TO THE BEGINNING OF THE COMMERCIAL BASED ON POSITION INFORMATION IN THE CORRESPONDING CONTENT SEGMENT METADATA
164
RENDER COMMERCIAL TO OUTPUT DEVICE AT NORMAL SPEED (E.G, 1X), FROM THE BEGINNING OF THE COMMERCIAL
166
IDENTIFY END OF COMMERCIAL
168
RENDER NEXT CONTENT SEGMENT TO DISPLAY DEVICE AT ACCELERATED SPEED (E.G., 2X NORMAL SPEED)
169
END

FIG. 7

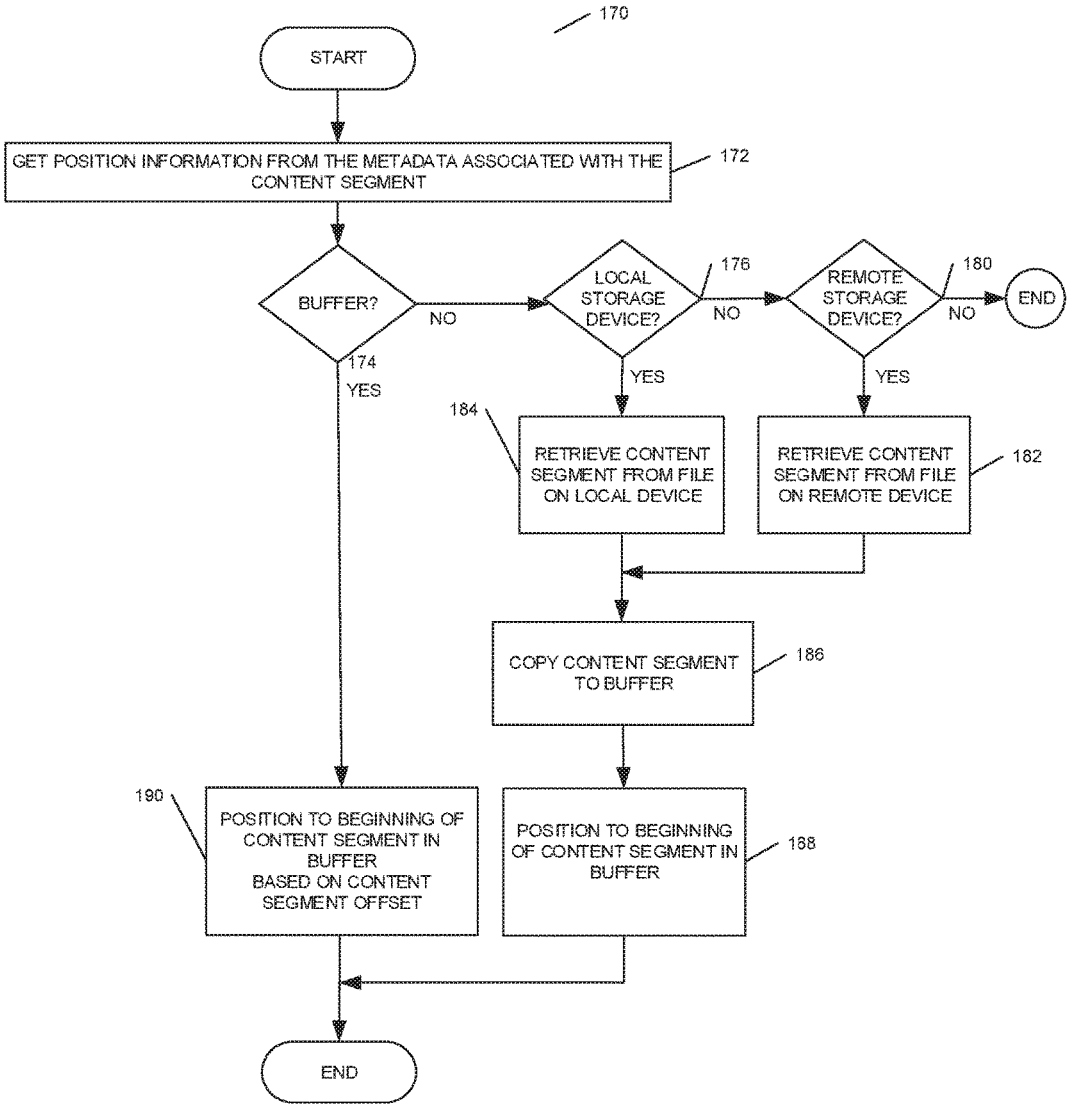
170
START
GET POSITION INFORMATION FROM THE METADATA ASSOCIATED WITH THE CONTENT SEGMENT
172
BUFFER?
NO
LOCAL STORAGE DEVICE?
176
NO
REMOTE STORAGE DEVICE?
180
NO
END
174
YES
YES
YES
184
RETRIEVE CONTENT SEGMENT FROM FILE ON LOCAL DEVICE
RETRIEVE CONTENT SEGMENT FROM FILE ON REMOTE DEVICE
182
COPY CONTENT SEGMENT TO BUFFER
186
190
POSITION TO BEGINNING OF CONTENT SEGMENT IN BUFFER BASED ON CONTENT SEGMENT OFFSET
POSITION TO BEGINNING OF CONTENT SEGMENT IN BUFFER
188
END

FIG. 8

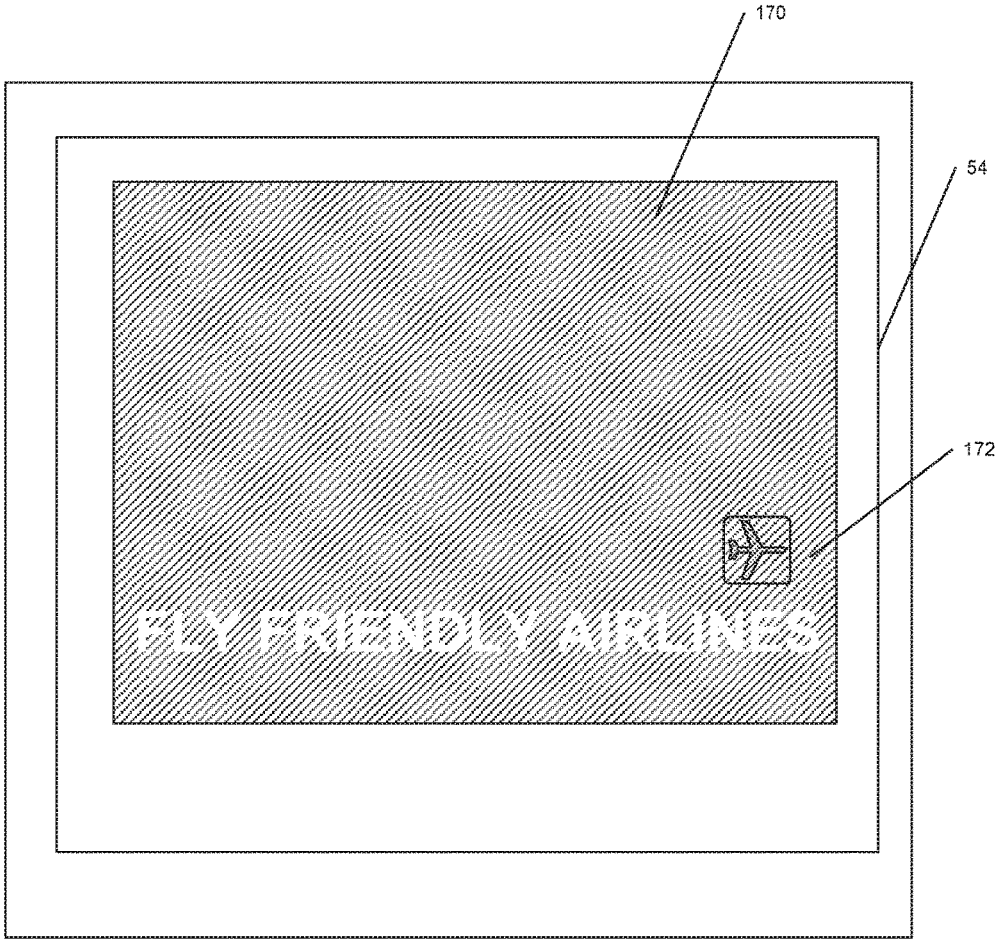

FIG. 9

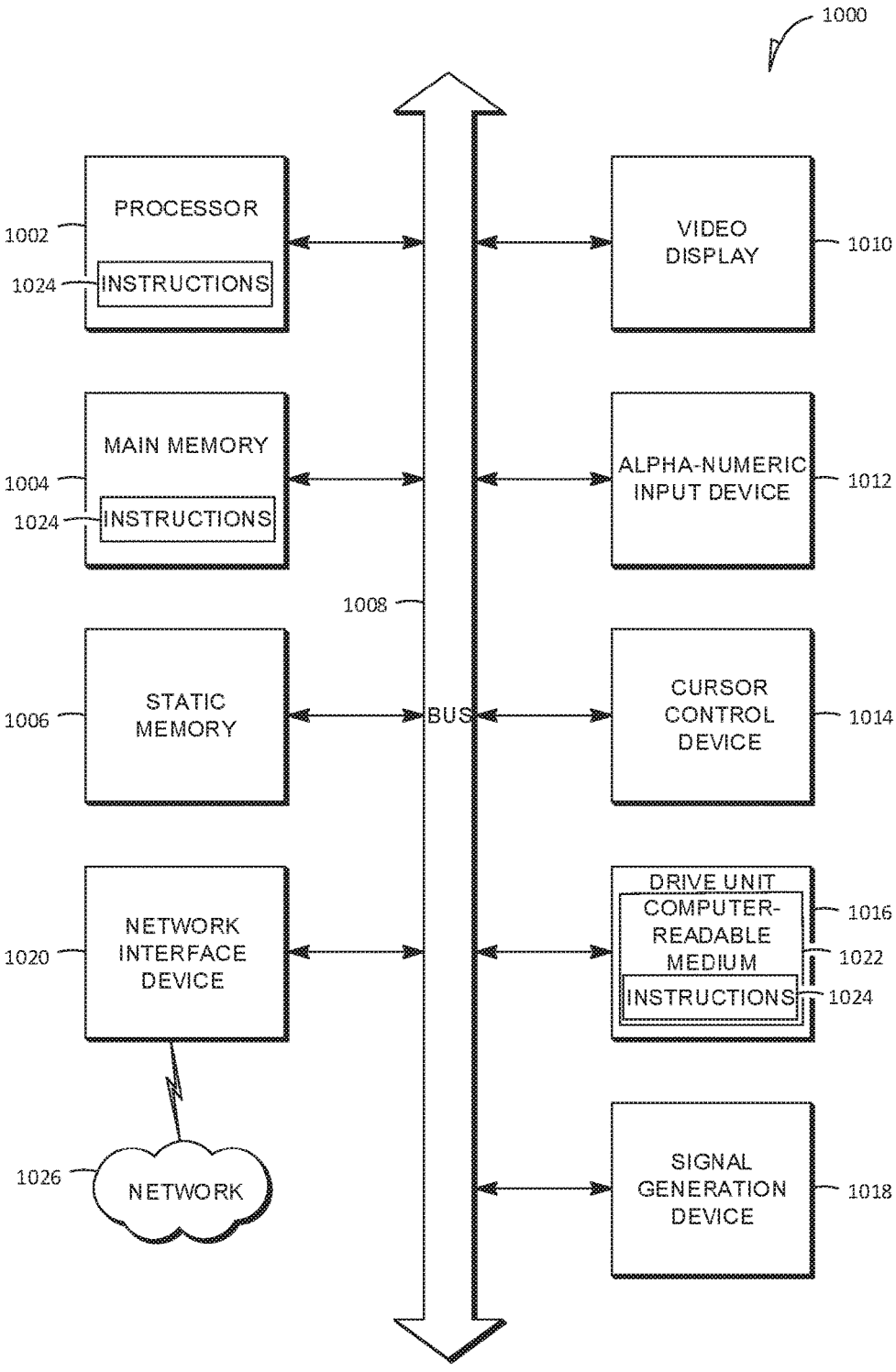
1000
PROCESSOR
1002
INSTRUCTIONS
1024
MAIN MEMORY
1004
INSTRUCTIONS
1024
STATIC MEMORY
1006
NETWORK INTERFACE DEVICE
1020
1026
NETWORK
1008
BUS
VIDEO DISPLAY
1010
ALPHA-NUMERIC INPUT DEVICE
1012
CURSOR CONTROL DEVICE
1014
DRIVE UNIT
COMPUTER-READABLE MEDIUM
1016
1022
INSTRUCTIONS
1024
SIGNAL GENERATION DEVICE
1018

FIG. 10

SYSTEMS AND METHODS TO POSITION AND PLAY CONTENT

RELATED APPLICATIONS

This application is a continuation application which claims the priority benefit of U.S. application Ser. No. 14/696,307, filed Apr. 24, 2015, which is a continuation application which claims the priority benefit of U.S. application Ser. No. 13/670,658, filed Nov. 7, 2012, which is a continuation application which claims the priority benefit of U.S. application Ser. No. 11/680,360, filed Feb. 28, 2007, which claims the priority benefit of U.S. Provisional Application No. 60/824,797, filed Sep. 7, 2006, all of which are incorporated herein by reference in their entirety.

FIELD

Embodiments relate generally to the technical field of communications and more specifically to systems and methods to position and play content.

BACKGROUND

Receiving devices such as personal video recorders (PVRs) or digital video recorders (DVRs) provide support for trick mode requests that enable a user to fast forward or rewind content. For example, a user who has recorded a television program and advertisements on a PVR may fast forward through the content. Advertisers are wary of the fast forwarding because their advertisements are being skipped. The communications industry has responded by providing so-called "speed bump" technology. A "speed bump" is a warning to slow down. In the present context, a "speed bump" may warn a user that an advertisement that is fast forwarding or rewinding on a display device may be of interest to the user. For example, a speed bump may be a Mercedes Benz trademark that is superimposed over an advertisement for a Mercedes Benz Automobile that is fast forwarding. Accordingly, a user that is shopping for a Mercedes Benz may be alerted by the speed bump that the fast forwarding advertisement includes subject matter that is of interest to the user, a Mercedes Benz. Notwithstanding the user's interest, in some instances, the user may be unable or unwilling to enter the set of commands that are necessary to play the advertisement from the beginning at a normal speed.

BRIEF DESCRIPTION OF DRAWINGS

Embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

FIG. **1** is a block diagram illustrating a system, according to an example embodiment, to position and play content;

FIG. **2** is a block diagram illustrating content, according to an example embodiment;

FIG. **3** is a block diagram illustrating a content segment, according to an example embodiment;

FIG. **3A** is a block diagram illustrating position information, according to an example embodiment;

FIG. **4** is a block diagram illustrating playout information, according to an example embodiment;

FIG. **5** is a block diagram illustrating a buffer and operations, according to an example embodiment;

FIG. **6** is a block diagram illustrating a buffer and operations, according to an example embodiment;

FIG. **7** is a flowchart illustrating a method, according to an example embodiment, to position and play a content segment;

FIG. **8** is a diagram illustrating a method, according to an example embodiment, to automatically position to the beginning of a content segment;

FIG. **9** is a diagram illustrating an image on a display device, according to an example embodiment; and

FIG. **10** is a block diagram of a machine, according to an example embodiment, including instructions to perform any one or more of the methodologies described herein.

DETAILED DESCRIPTION

In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of example embodiments of the present invention. It will be evident, however, to one skilled in the art that the present invention may be practiced without these specific details.

Example embodiments describe processing a request to position and play a content segment. For example, a user that is fast forwarding through an advertisement may want to view the advertisement from the beginning at a normal speed. Accordingly, the user may select a button on a remote control (e.g., Play button, Position and Play button, etc.) to initiate automatic positioning to the beginning of the advertisement and playing of the advertisement at a normal speed. For example, in response, to a request to position and play an advertisement that may be fast forwarding, the advertisement may be associated to metadata that may include position information used to identify the beginning of the advertisement. Next, the advertisement may be positioned to the beginning of the advertisement based on the metadata and played to the user at a normal speed for the advertisement. For example, a jump operation may be performed to jump immediately to the beginning of the advertisement. In some embodiments, fast forwarding is resumed responsive to the end of the advertisement. In other embodiments, a play mode or normal speed is maintained responsive to the end of the advertisement. Also, for example, if the advertisement is rewinding, a request to position and play the advertisement may cause a jump to the beginning of the advertisement and play of the advertisement to the user at a normal speed for the advertisement. Other embodiments may include, playing an extended version of the advertisement. Yet other embodiments may include retrieving a version of the advertisement from a remote or local storage device.

Terminology

Content in this document is intended to include media that may be played on a receiving device or interacted with on a receiving device. Content may include but is not limited to entertainment content and advertisement content. Further, content may include video content and/or audio content and/or multimedia content and associated metadata. Further, content may include prerecorded content or live content.

Normal Speed in this document is intended to include an instantaneous speed to render a discrete unit of content (e.g., content segment) to an output device, the normal speed being the speed necessary to completely render the content segment from beginning to end in a predetermined play time that is associated with the content segment. For example, an

episode of Gilligan's Island may be rendered at a receiving device at a normal speed such that the episode completes in a predetermined running time (e.g., play time) of twenty-five minutes. Play times may be published with the content segment. For example, movies may be stored on media and labeled with the play time of the movie. A normal speed may be applicable to advancing the discrete unit of content in forward or reverse directions.

Accelerated Speed in this document is intended to include an instantaneous speed to render a discrete unit of content to an output device, the accelerated speed being any speed greater than the normal speed associated with the discrete unit of content. An accelerated speed may be applicable to advancing the discrete unit of content in forward or reverse directions.

Point to Multi-Point Communications

The subject matter of the present disclosure may be embodied using point to multi-point communications. For example, point to multi-point communications may be embodied as a broadcast system that includes an insertion server that broadcasts a transmission that includes content to multiple receiving devices (e.g., settop boxes).

Point to Point Communications

The subject matter of present disclosure may also be embodied using point to point communications. For example, point to point communications may be embodied as a video on demand system that includes a streaming server that may communicate or stream content to a single receiving device (e.g. client computer).

FIG. **1** is a block diagram illustrating a system **10**, according to an example embodiment. The system **10** is shown to include a receiving device **12**, a broadcast system **14**, a video on demand system **15**, and a network **16**. The receiving device **12** may, for example, include a set top box (STB), a personal computer, an iPod, a personal video recorder (PVR) (e.g., analog or digital input), a personal digital recorder (PDR) (e.g., analog or digital input), a mobile phone, a portable media player, a game console or any other device capable of playing video and/or audio content. The receiving device **12** may include a local storage device **18** that includes a memory **20** and/or a database **22** that may store content **32**, a decoder system **24**, and may be coupled to an output device **26**. The receiving device **12** may further include a processor **28**, a memory **30**, a demultiplexer **33**, an audio module **34**, a video module **36**, a descrambler **38**, control buttons **40**, an interface **42**, an interface **44**, a request module **48**, and a communication module **50**. The processor **28** may execute instructions, move data (e.g., content **32**), process data, etc. The demultiplexer **33** may demultiplex the content **32** into audio, video, and meta-data streams that may be respectively communicated to the audio module **34**, the video module **36** and the descrambler **38**. The meta-data streams may further be communicated to the processors **28**, **70** or the memory **30**, **20**. The metadata stream may include position information that may be used to identify the location and the beginning of a content segment and descrambling information that may include conditional access decryption keys that may be used by the descrambler **38** to descramble or decrypt the audio and video streams. Other embodiments may not include the descrambler **38**. The audio module **34** may process the audio stream and store the audio stream in the form of packets or frames in the memory **20**. Similarly, the video module **36** may process the video stream and store the video stream in the form of packets or frames in the memory **20**. In an example embodiment, the receiving device **12** may be operated or controlled with control buttons **40** and/or a remote control **41**. The output device **26** may include a sound device **52** and a display device **54**, however, it will be appreciated by those skilled in the art that the output device **26** may also include a machine device to communicate machine interface information (e.g., SGML) to a machine (e.g., client, server, peer to peer).

The request module **48** may receive requests that may be entered with the control buttons **40** or remote control **41** and received via the interface **44**. For example, the request module **48** may receive a request to play the content, a request to fast forward the content, a request to rewind the content, a request to pause content, a request to position to the beginning of a content segment and to play the content segment or other types of requests. The communication module **50** may respond to requests received by the request module **48**. For example, the communication module **50** may respond by identifying the content segment that is presently advancing at an accelerated speed, using metadata included with the content segment to position to the beginning of the content segment, and causing the content segment to be played or rendered at a normal speed on the output device **26**. In another example, the communication module **50** may retrieve a second content segment that is rendered instead of the original content segment. For example, the communication module **50** may retrieve the second content segment from a remote storage device **55**. In one embodiment a remote storage device **55**, as shown connected to a streaming server **58** at the video on demand system **15**, may include a database **56** that may be used to store the second content segment (e.g., content **32**).

The decoder system **24** is shown to include a processor **70**, the memory **20**, the decoder **72** and a render module **74**. The processor **70** may be used for executing instructions and moving data. For example, the processor **70** may be used to move the content **32** or other data from the memory **20** to the decoder **72**. The decoder **72** may decode the packets/frames into image and sound data. The render module **74** may render the sound data to the sound device **52** and render the image data to the display device **54**.

The local storage device **18** may include a circular buffer that includes both the memory **20** and the database **22**. The circular buffer may be utilized by the receiving device **12** to store the content **32**. For example, a user may be watching a movie and select a pause button on the remote control **41** that causes the movie to be stored in the circular buffer. Next, the user may select the play button on the remote control **41** to cause the receiving device **12** to resume rendering the movie to the output device **26** by retrieving the movie from the circular buffer.

The interface **42** may enable the receiving device **12** to receive a transmission from the broadcast system **14** and/or a stream from the video on demand system **15**.

The network **16** may be any network capable of communicating video and/or audio and may include the Internet, closed IP networks such as DSL or FTTH, digital broadcast satellite, cable, digital, terrestrial, analog and digital (satellite) radio, etc. and/or hybrid solutions combining one or more networking technologies.

The broadcast system **14** is shown to include an insertion server **80**, a live feed **82**, and a database **84**. The insertion server **80** may communicate the content **32** in a transmission to the receiving device **12**. The transmission may be formatted in a Moving Pictures Expert Group-2 (MPEG-2) transport format, a MPEG-4 transport format, an Internet Protocol (TCP/IP) transport format, QuickTime, or any other similar transport mechanisms/formats. Further, the transmission may include an MPEG-2 compressed video

stream, a MPEG-4 compressed video stream, a VC1 compressed video stream, or any other similar compression formats. The insertion server **80** may receive the content **32** from the database **84** (e.g., prerecorded content **32**) or the content **32** from the live feed **82** (e.g., live content **32**).

Further, the video on demand system **15**, as previously described, includes the streaming server **58**. The streaming server **58** may communicate the content **32** to the receiving device **12**. For example, the receiving device **12** may receive the content **32** in the form a stream that may be communicated as part of the real time streaming protocol (RTSP) or the digital storage media command and control protocol (DSM-CC) from the streaming server **58**.

While the system **10** shown in FIG. **1** employs a client-server architecture, the present disclosure is of course not limited to such an architecture, and could equally well find application in a distributed, or peer-to-peer, architecture system. The request module **48** and communication module **50** may also be implemented as standalone software programs, which do not necessarily have networking capabilities.

FIG. **2** is a block diagram illustrating content **32**, according to an example embodiment of the present disclosure. The content **32** is shown to include multiple content segments **92** that may be played in chronological sequence from right to left. The content segment **92** (e.g., prerecorded or live) may include a commercial, a public service announcement, an infomercial, an audio/video asset such as a movie, television program such as a documentary, a biography, a cartoon, a program, music, or music video or an audio asset such as music track, audio interview, news program or any other content. In some embodiments, the content segment **92** may include an interactive application that when executed at the receiving device **12** may result in a presentation to a user that enables the user to interact with the content segment **92**. For example, a content segment **92** in the form of an episode of "American Idol" may include an interactive application that may cause a pop-up that enables an end user to cast a vote.

FIG. **3** is a block diagram illustrating an example embodiment of a content segment **92**. The content segment **92** is shown to include audio data **94**, video data **96** and metadata **98**. The content segment **92** is further shown to be divided into parts **93** of audio data **94**, video data **96**, and metadata **98**. The first part of the content segment **92** is shown on the right and the last part of the content segment **92** is shown on the left. Accordingly, the parts **93** of the content segment **92**, as illustrated, may be played from right to left. The audio data **94** includes audio information that may be used to generate sound. The video data **96** includes video information that may be used to generate visual (e.g., motion, stills, animation, illustrations, etc.). The metadata **98** includes metadata information that may be used to process the audio data **94** and video data **96** (e.g., descramble), enhance the audio data **94** and video data **96** (e.g., enhance with an interactive quality to enable interaction with the user), and position and play the content segment **92**. For example, the content segment **92** is shown to include position information **100** that may be used to position the content segment **92** to the beginning and play the content segment **92** from the beginning.

FIG. **3A** is a block diagram illustrating position information **100**, according to an example embodiment of the present disclosure. The position information **100** may include a content segment identifier **101** and/or a fast forward block **103**. The content segment identifier **101** may include a network address **105** and a content segment offset **107**. The network address **105** may identify a file or a buffer that may contain the content segment **92**. The content segment offset **107** may identify the location of the content segment **92** in the file or the buffer **106**. For example, the network address **105** may identify a buffer in the memory **20**, **30** (e.g., buffer address), a local storage device (e.g., local storage device **18**), or a remote storage device (e.g., remote storage device **55**). In one embodiment, the network address **105** may be a universal resource locator (URL). Accordingly, the network address **105** and the content segment offset **107** may be used by the receiving device **12** to position to the beginning of the content segment **92** for render to the receiving device **12**. In one embodiment, the position information **100** may include multiple content segment identifiers **101** that correspond to different versions of the content segment **92**. For example, the multiple versions of the content segment **92** may include an extended version of a commercial and an abbreviated version of the commercial. For example, the user may be fast forwarding through a content segment **92** that includes a commercial and request to position and play a version of the commercial that is different from the version that is fast forwarding. Indeed, the user may select a dedicated control button or function key on the remote control **41** to view an extended version (e.g., sixty seconds) or an abbreviated version (e.g., ten seconds) of the commercial instead of the standard version of the commercial (e.g., twenty seconds) that may be fast forwarding on the receiving device **12**. In one embodiment the content segment **92** (e.g., commercial) may include an interactive capability that enables the user to interact with the content segment **92** (e.g., commercial).

The fast forward block **103** may prevent the user from fast forwarding through the associated content segment **92**. Accordingly, a position and play request may not be processed for a content segment **92** that may not be fast forwarded. Nevertheless, the fast forward block **103** does not preclude processing a position and play request during a rewind of the same content segment **92**.

FIG. **4** is a block diagram illustrating an example embodiment of playout information **104**. The receiving device **12** may use the playout information **104** to process requests received by the receiving device **12**. The playout information **104** includes a buffer **106**, a location **108**, a mode **109** and a speed **111**. The buffer **106** may be used to store a content segment **92**. The buffer **106** may include any combination or type of storage devices (e.g., memory, disk, compact disk, etc.) The location **108** is an address in the buffer **106** that is presently being processed. For example, the location **108** may identify the next video data **96** and audio data **94** in the content segment **92** to be rendered to the output device **26**. Further, the location **108**, for example, may rapidly increase (e.g., fast forward), rapidly decrease (e.g., rewind), slowly increase (e.g., play), etc. The mode may be used to store the present mode associated with the content segment **92** (e.g., play, fast forward, rewind, position and play, etc.). The speed **111** may be used to store the present speed of the content segment **92** (e.g., 1× normal, 2× normal, 3× normal, etc.) and may indicate a forward or reverse motion.

FIG. **5** is a block diagram illustrating example embodiments of operations **110** performed in response to a request to position and play. The operations **110** are illustrated below a buffer **106** that stores content segments **92** that may be rendered (e.g., play) to an output device **26** coupled to a receiving device **12**. The operations **110** commence with a request **112**, from a user, to fast forward the content segment **92**. For example, the user may be watching an episode of Gilligan's Island and select a fast forward button on a remote

control **41** that causes fast forwarding to begin, as illustrated by callout **114**. The fast forward is illustrated as continuing into the next content segment **92** that includes a commercial. Indeed, the receiving device **12** may respond by causing a speed bump to be displayed on the display device **54**. For example, in one embodiment the speed bump may be still image that represents the content of the commercial (e.g., Mercedes Benz Logo). The user may see the speed bump and enter a request **116** to position and play the commercial from the beginning. In response to receiving the request **116**, the receiving device **12** may use the corresponding position information **100** (e.g., callout **87**) in the metadata **98** to jump to the beginning of the commercial in the buffer **106**, as illustrated by the arrow **118**. Other embodiments may respond to the request **116** by rewinding to the beginning of the commercial. At operation **120**, the commercial is rendered to an output device **26** (e.g., play) at a normal speed from the beginning of the commercial until the end of the commercial. At operation **122**, responsive to reaching the end of the commercial, the receiving device **12** may resume fast forwarding (e.g., accelerated speed) Gilligan's Island. Other embodiments may respond to reaching the end of the commercial by continuing at a normal speed in play mode.

It will be appreciated, that the audio data **94**, video data **96**, and metadata **98** may not necessarily be stored the same physical buffer **106**. For example, in one embodiment the audio data **94**, video data **96**, and metadata **98** may be stored in respective buffers **106**. Nevertheless, the processing, as described above, may remain substantially the same. Further it will be appreciated that the buffer **106** may not be a physical buffer; but rather, a logical buffer **106** that may be implemented in multiple physical storage devices (e.g., memory, disk, DVD, etc.)

FIG. **6** is a block diagram illustrating example embodiments of operations **130** performed in response to a request to position and play. The operations **130** are illustrated below a buffer **106** that stores content segments **92** that are being rendered (e.g., play) to an output device **26** coupled to a receiving device **12**. The operations **130** commence with a request **132** from a user to rewind the content **32**. For example, the user may be watching an episode of Gilligan's Island and select a rewind button on a remote control **41** that causes rewinding to begin (e.g., callout **134**). The rewinding continues past the next content segment **92** of Gilligan's Island and continues into a content segment **92** that includes a commercial. The receiving device **12** responds to entering the content segment for the commercial by causing a speed bump to be displayed on the display device **54**. For example, in one embodiment the speed bump may be still image that represents the content of the commercial (e.g., Mercedes Benz Logo). The user may see the speed bump and enter a request **136** to position and play the commercial from the beginning. In response to receiving the request **136**, the receiving device **12** may use the corresponding position information **100** (e.g., callout **138**) in the metadata **98** to jump (e.g., callout **140**) to the beginning of the content segment **92** (e.g., commercial) in the buffer **106**. Other embodiments may respond to the request **136** by continuing to rewind to the beginning of the commercial. At operation **141**, the commercial is played or rendered to an output device **26** (e.g., play) at a normal speed from the beginning of the commercial. At operation **142**, responsive to reaching the end of the commercial, the receiving device **12** may resume rewinding at an accelerated speed. Other embodiments may respond to reaching the end of the commercial by continuing to render at a normal speed in the play mode.

It will be appreciated, that the audio data **94**, video data **96**, and metadata **98** may not necessarily be stored the same physical buffer **106**. For example, in one embodiment the audio data **94**, video data **96**, and metadata **98** may be stored in respective buffers **106**. Nevertheless, the processing, as described above, may remain substantially the same. Further it will be appreciated that the buffer **106** may not be a physical buffer; but rather, a logical buffer **106** that may be implemented in multiple physical storage devices (e.g., memory, disk, DVD, etc.)

FIG. **7** is a flowchart illustrating a method **150**, according to an example embodiment, to position and play a content segment. Illustrated are operations performed at the receiving device **12**. The method **150** commences at the receiving device **12**, at operation **152**, with the user pausing a content segment **92** that is being broadcast over the network **16** in a transmission to the receiving device **12**. For example, the user may be viewing an episode of Giligan's Island and press the stop or pause button on a remote control **41** that, in turn, causes the request module **48** to receive the request to pause.

At operation **154**, the communication module **50** responds to the request to pause by causing the receiving device **12** to store content segments **92** to the local storage device **18**. For example, the communication module **50** may cause the storage of Giligan's Island, commercials, advertisements, and any other content segment **92** that may be broadcast while the receiving device **12** is paused.

At operation **156**, the request module **48** receives a request from the user to fast forward at two-times normal speed. For example, the request may be entered by the user who selects a button on the remote control **41**. The request may include a direction identifier (e.g., forward or reverse) that identifies the forward direction and a speed identifier (e.g., 2×, 4×, 6×, etc.) that identifies two times normal speed. The request module **48** responds to the fast forward request by using the location **108** in the playout information **104** to identify the position information **100** in the content segment **92** that is presently being rendered to the output device **26**. If the position information **100** includes a fast forward block **103** that prohibits fast forwarding then the request is ignored. Otherwise the content segment **92** is fast forwarded. In the present example, the episode of Giligan's Island is not blocked.

At operation **158**, the receiving device **12** renders the content segments **92** at an accelerated speed to the output device **26**. For example, the render module **74** may render Giligan's Island at twice-times the normal speed on the display device **54**.

At operation **160**, the receiving device **12** continues to render the content segments **92** at an accelerated speed. For example, the render module **74** may render a commercial for Friendly Airlines at two-times normal speed on the display device **54** provided that the request module **48** determines that the commercial is not blocked from fast forwarding. In the present example, the commercial is not blocked and is rendered to at twice-times the normal speed on the display device **54**. In addition, the receiving device **12** may cause the render module **74** to render a speed bump for Friendly Airlines superimposed over the Friendly Airlines commercial on the display device **54**.

At operation **162**, the user may see the speed bump and decide to watch the commercial by entering a position and play request that may be received by the request module **48**. For example, the user may select a play button on the remote control **41** to enter a position and play request. In another

embodiment, the user may select another button on the remote control **41** that may be associated with the position and play function.

At operation **164**, the communication module **50** automatically positions the commercial to the beginning of the commercial. For example, the communication module **50** may use the position information **100** in the metadata **98** of the content segment **92** to identify the location of the beginning of the commercial in a buffer **106** and to position to the beginning of the commercial.

At operation **166**, the render module **74** may render the commercial at a normal speed to the output device **26** from the beginning of the commercial. For example, the user may view the entire commercial from the beginning at a normal speed for the commercial thereby enabling the user to receive the message communicated by the commercial.

At operation **168**, communication module **50** identifies the end of the commercial. At operation **169** the communication module **50** responds to the identification of the end of the commercial by causing the render module **74** to resume fast forwarding. For example, the render module **74** may render the next content segment **92** to the display device at an accelerated speed. In other embodiments, the communication module **50** may cause the render module **74** to continue in play mode. For example, the render module **74** may render the next content segment **92** to the display device at a normal speed for the content segment **92**.

FIG. **8** is a diagram illustrating a method **170**, according to an example embodiment, to automatically position to the beginning of a content segment **92**. The method **170** commences at operation **172** with the communication module **50** accessing position information **100** associated with the content segment **92** that is currently being rendered to the output device **26**. For example, the communication module **50** may utilize the location **108** in the playout information **104** to identify the appropriate position information **100** in the metadata **96** in the buffer **106**.

At operation **174**, the communication module **50** uses the network address **105** in the position information **100** to determine the location of the beginning of the content segment **92** to be played in response to the request to position and play content. For example, if the network address **105** indicates the content segment **92** is stored in the buffer **106** then a branch is made to operation **190**. Otherwise a branch is made to decision operation **176**.

At decision operation **176**, the communication module **50** uses the network address **105** in the position information **100** to determine if the content segment **92** is in stored on a local storage device **18**. For example, if the content segment is stored on the database **22**, then a branch is made to operation **184**. Otherwise a branch is made to decision operation **180**.

At decision operation **180**, the communication module **50** uses the network address **105** in the position information **100** to determine if the content segment **92** is in stored on a remote storage device **55**. For example, if the content segment is stored on the database **56**, then a branch is made to operation **182**.

At operation **182**, the communication module **50** retrieves the content segment from the database **56**. For example, the communication module **50** may use the network address **105** and the content segment offset **107** to retrieve the content segment **92** from a file stored on the database **56**.

At operation **184**, the communication module **50** retrieves the content segment **92** from the database **22**. For example, the communication module **50** may use the network address **105** and the content segment offset **107** to retrieve the content segment **92** from a file stored on the database **22**.

At operation **186**, the communication module **50** moves the content segment **92** to the buffer **106** and at operation **188** the communication module **50** positions to the beginning of the content segment **92** in the buffer.

At operation **190**, the communication module **50** positions to the beginning of the content segment **92** in the buffer based on the content segment offset **107**.

Other Example Embodiments—Point to Point Embodiment

In another example embodiment that may be identified as the point to point embodiment, the request module **48** and the communication module **50** may operate at the streaming server **58**. The point to point embodiment requires the receiving device **12** to communicate the requests over the network **16** to the streaming server **58** to be processed by the request module **48** that executes at the streaming server **58** and the communication module **50** that executes at the streaming server **58**

Other Example Embodiments—Medium and Presentation of Content Segment

Other examples may include the content segment **92** embodied in one or more mediums (e.g., visual, audio, kinetic, etc.), the visual medium presented as motion or still.

Other Example Embodiments—Speed Bumps and Entertainment Content Segments

Other Example Embodiments may include the content segment **92** embodied as entertainment rather than an advertisement or commercial. For example, the speed bump may be used to identify key scenes in a movie and the user may utilize the control buttons **40** or the remote control **41** to select a button that requests a viewing of the key scene from the beginning to the key scene.

Other Examples Embodiments—Local or Remote Storage Device

Further, it will be appreciated by one skilled in the art that the content segment **92** need not be transferred from the buffer **106**, as illustrated in the method above. Rather, a second content segment **92** that is different from the fast forwarded advertisement may be rendered at the receiving device **12**. For example, the second content segment **92** may be an extended version of the advertisement and may be retrieved from a local storage device **18** (e.g., database **22**) or a remote storage device **55** (e.g., database **56**) based on a network address (e.g., URL) in the metadata **98**. In one embodiment, the second content segment **92** (e.g., extended version) may be retrieved based on a different control button **40** or different button on the remote control **41**.

Other Example Embodiments—Content Segment Played at Accelerated Speed

Further, it will be appreciated by a person having ordinary skill in the art that the above described content segment **92** may be designed to be played at normal speed or at any speed within a range of speeds around the normal speed (e.g., accelerated speeds) to achieve a high quality play out.

FIG. **9** is an image **170** that is rendered on a display device **54**, according to an example embodiment. The image **170** is rendered from a content segment **92** that is an advertisement

or commercial for "Friendly Airlines." The content segment **92** is being fast forwarded and is shown to be superimposed with a speed bump **172**, "Fly Friendly Airlines." The speed bump **172** may be superimposed over the image on the display device **54** when the content segment **92** is fast forwarding or rewinding.

FIG. **10** shows a diagrammatic representation of a machine in the example form of a computer system **1000** within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed. In alternative example embodiments, the machine operates as a standalone device or may be connected (e.g., networked) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client machine in server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine may be a server computer, a client computer, a personal computer (PC), a tablet PC, a set-top box (STB), a Personal PrimaryAssistant (PDA), a cellular telephone, a web appliance, a network router, switch or bridge, an iPod, a personal video recorder (PVR) (e.g., analog or digital input), a personal digital recorder (PDR) (e.g., analog or digital input), a mobile phone, a portable media player, a game console or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. Further, while only a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

The example computer system **1000** includes a processor **1002** (e.g., a central processing unit (CPU) a graphics processing unit (GPU) or both), a main memory **1004** and a static memory **1006**, which communicate with each other via a bus **1008**. The computer system **1000** may further include a video display unit **1010** (e.g., a liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system **1000** also includes an alphanumeric input device **1012** (e.g., a keyboard), a cursor control device **1014** (e.g., a mouse), a disk drive unit **1016**, a signal generation device **1018** (e.g., a speaker) and a network interface device **1020**.

The disk drive unit **1016** includes a machine-readable medium **1022** on which is stored one or more sets of instructions (e.g., software **1024**) embodying any one or more of the methodologies or functions described herein. The software **1024** may also reside, completely or at least partially, within the main memory **1004** and/or within the processor **1002** during execution thereof by the computer system **1000**, the main memory **1004** and the processor **1002** also constituting machine-readable media.

The software **1024** may further be transmitted or received over a network **1026** via the network interface device **1020**.

While the machine-readable medium **1022** is shown in an example embodiment to be a single medium, the term "machine-readable medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term "machine-readable medium" shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the present disclosure. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic media, and carrier wave signal.

Thus, systems and methods to position and play content have been described. Although the present disclosure has been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these example embodiments without departing from the broader spirit and scope of the disclosure. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

I claim:

1. A method comprising:

causing a displaying of media content comprising multiple units of content, the multiple units of content comprising at least a first unit of content that has a reference point within the first unit of content;

while the first unit of content is being displayed at a first combination of playback direction and playback speed, receiving a request to display the first unit of content at a second combination of playback direction and playback speed;

in response to the request, interrupting the displaying of the media content at an interruption point that is within the first unit of content and distinct from the reference point, and causing a displaying of the first unit of content at the second combination of playback direction and playback speed from the reference point; and

resuming the displaying of the media content after the displaying of the first unit of content at the second combination of playback direction and playback speed has ended.

2. The method of claim **1**, wherein:

the media content further comprises a second unit of content; and

the resuming of the displaying of the media content comprises causing a displaying of the second unit of content at the first combination of playback direction and playback speed.

3. The method of claim **1**, wherein:

the resuming of the displaying of the media content is in response to a detection that an end of the first unit of content has been displayed.

4. The method of claim **1**, wherein:

the reference point within the first unit of content is a beginning of the first unit of content.

5. The method of claim **1**, wherein:

the first and second combinations of playback direction and playback speed specify different playback modes selected from a group of playback modes consisting of play, fast-forward, and rewind.

6. The method of claim **1**, wherein:

the first and second combinations of playback direction and playback speed specify different playback speeds in a same playback direction.

7. The method of claim **1**, wherein:

the first and second combinations of playback direction and playback speed specify different playback directions.

8. The method of claim **1**; further comprising:

causing superimposition of an image over the first unit of content while the first unit of content is being displayed at the first combination of playback direction and playback speed.

9. The method of claim **8**, wherein:

the image represents subject matter of the first unit of content.

10. The method of claim 1, wherein:

the first unit of content is stored in a buffer while the first unit of content is being displayed at the first combination of playback direction and playback speed; and

the causing of the displaying of the first unit of content at the second combination of playback direction and playback speed from the reference point comprises moving a present location within the buffer to a buffer address that corresponds to the reference point.

11. A method comprising:

causing a displaying of first media content comprising multiple units of content, the multiple units of content comprising at least a first unit of content that has a reference point within the first unit of content;

while the first unit of content is being displayed at a first combination of playback direction and playback speed, receiving a request to display second media content at a second combination of playback direction and playback speed, the second media content comprising a version of the first unit of content;

in response to the request, interrupting the displaying of the first media content at an interruption point that is within the first unit of content and distinct from the reference point, and causing a displaying of the second media content at the second combination of playback direction and playback speed from a beginning of the second media content; and

resuming the displaying of the first media content after the displaying of the second media content at the second combination of playback direction and playback speed has ended.

12. The method of claim 11, wherein:

the first media content further comprises a second unit of content; and

the resuming of the displaying of the first media content comprises causing a displaying of the second unit of content at the first combination of playback direction and playback speed.

13. The method of claim 11, wherein:

the resuming of the displaying of the first media content is in response to a detection that an end of the second media content has been displayed.

14. The method of claim 11, wherein:

the second media content comprises an extended version of the first unit of content.

15. The method of claim 11, wherein:

the second media content comprises an abbreviated version of the first unit of content.

16. The method of claim 11, wherein:

the second media content comprises an interactive application.

17. A system comprising:

a render module comprising one or more processors and configured to cause a displaying of media content comprising multiple units of content, the multiple units of content comprising at least a first unit of content that has a reference point within the first unit of content; and

a request module comprising one or more processors and configured to, while the first unit of content is being displayed at a first combination of playback direction and playback speed, receive a request to render the first unit of content at a second combination of playback direction and playback speed;

the render module being further configured to, in response to the request, interrupt the displaying of the media content at an interruption point that is within the first unit of content and distinct from the reference point, and cause a displaying of the first unit of content at a second combination of playback direction and playback speed from the reference point;

the render module being further configured to resume the displaying of the media content after the displaying of the first unit of content at the second combination of playback direction and playback speed house ended.

18. The system of claim 17, wherein:

the first and second combinations of playback direction and playback speed specify different playback speeds in a same playback direction.

19. A system comprising:

a render module comprising one or more processors and configured to cause a displaying of first media content comprising multiple units of content, the multiple units of content comprising at least a first unit of content that has a reference point within the first unit of content; and

a request module comprising one or more processors and configured to, while the first unit of content is being displayed at a first combination of playback direction and playback speed, receive a request to render second media content at a second combination of playback direction and playback speed; the second media content comprising a version of the first unit of content;

the render module being further configured to, in response to the request, interrupt the displaying of the first media content at an interruption point that is within the first unit of content and distinct from the reference point, and cause a displaying of the second media content at the second combination of playback direction and playback speed from a beginning of the second media content;

the render module being further configured to resume the displaying of the first media content after the displaying of the second media content at the second combination of playback direction and playback speed has ended.

20. The system of claim 19, wherein:

the second media content comprises an extended version of the first unit of content.

* * * * *